615.902
E8x

Digitized by the Internet Archive
in 2016

https://archive.org/details/di2ethylhexylpht00illi

UNIVERSITY OF
ILLINOIS LIBRARY
AT URBANA-CHAMPAIGN
BOOKSTACKS

615.902
E8x

615.902
E8x

Illinois
Environmental
Protection Agency

Office of Chemical Safety
2200 Churchill Road, P.O. Box 19276
Springfield, Illinois 62794-9276

IEPA/ENV/93-066

September, 1993

- DI(2-ETHYLHEXYL)PHTHALATE -
CHEMICAL INFORMATION SHEET*

DEPOSITORY
NOV 1 0 1993
UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

WHAT IS DI(2-ETHYLHEXYL)PHTHALATE?

Di(2-ethylhexyl)phthalate (DEHP; bis(2-ethylhexyl)phthalate; BEHP; CAS# 117-81-7) is a colorless oily liquid with almost no odor. DEHP is primarily used in the production of polyvinyl chloride plastics where the chemical is used to make the plastic more flexible. These polyvinyl chloride (PVC) plastics are used to make many items such as toys, vinyl upholstery, shower curtains, housewares, sporting goods, medical gloves, and the flexible tubing used for various medical procedures. Due to health concerns, the use of DEHP in pacifiers, plastic food wrap, and most toys has been discontinued. Yearly production of DEHP has been reported to be approximately 270 million pounds.

WHAT IS THE ENVIRONMENTAL OCCURRENCE OF DI(2-ETHYLHEXYL)PHTHALATE?

Companies that manufacture, process, and use DEHP are required annually to report the quantity of environmental releases of the chemical to the air, water, and soil. In addition, the quantity of the chemical involved in off-site waste transfers is also reported. The Toxic Release Inventory (TRI) data for 1991 contained 16 Illinois facilities reporting total environmental releases of 3549 pounds of DEHP and total off-site waste transfers of 221,128 pounds. For the entire United States, the total environmental releases for 1991 were 1,203,405 pounds of DEHP and the total off-site waste transfer was 2,560,367 pounds. Off-site waste transfers primarily involve the transfer of the waste to landfills, incinerators, treatment plants, or recyclers. TRI data should be considered incomplete, however, due to the fact that only certain facilities are required to report. It is likely that these annually reported industrial releases are only a small percentage of the total DEHP releases to the environment. The greatest amount of DEHP is released to the environment from the disposal or incineration of plastic products containing DEHP.

DEHP is a nonvolatile substance and therefore levels of the chemical normally found in the air are relatively low. DEHP can be emitted to the air during the operation of incinerators or coal-fired power plants. These emissions are likely the result of improper operation of the furnaces which results in the incomplete destruction of the chemical during incineration.

DEHP can be released to surface waters as a component of industrial discharges and can be released to groundwater due to the leaching of the chemical from municipal and industrial landfills. DEHP released to surface water may be broken down by bacteria, attach to sediment, or be taken up by aquatic organisms. DEHP released to soil will bind tightly to the organic matter and is not expected to leach into groundwater. Under conditions where sufficient oxygen is present, DEHP has been found to be broken down by the bacteria present in soil or water systems.

DEHP has been found in fish, seafood, milk, cheese, meat, margarine, eggs, and cereal products. DEHP has also been found in blood used for transfusion due to leaching from the plastic material used to collect and store the blood.

WHAT ARE THE HEALTH EFFECTS ASSOCIATED WITH EXPOSURE TO DI(2-ETHYLHEXYL)PHTHALATE?

DEHP can be absorbed through the lungs and gastrointestinal tract. Animal studies indicate that DEHP is poorly absorbed through the skin.

Short-term exposure -- DEHP is considered to have a low order of acute toxicity. In humans, irritation of the eyes, nose, and throat has been reported. Human volunteers experienced irritation of the gastrointestinal tract after ingesting single doses of up to 10 grams (approximately 1/3 teaspoon) of DEHP. DEHP has been found to cause adverse effects on the offspring of rats and mice exposed to DEHP during pregnancy; however, similar effects have not been documented in humans.

Long-term exposure -- Long-term exposure of animals to DEHP has been found to result in adverse effects on the kidney and liver and decreased fertility in both male and female rats. Long-term feeding studies conducted in rats and mice have demonstrated an increased incidence of liver tumors due to exposure to DEHP. USEPA has classified DEHP as a probable human carcinogen (Group B2). This category is for agents for which there is sufficient animal evidence of carcinogenicity but inadequate human evidence.

UNIVERSITY OF
ILLINOIS LIBRARY
AT URBANA-CHAMPAIGN
BOOKSTACKS

HOW IS DI(2-ETHYLHEXYL)PHTHALATE REGULATED?

Threshold Limit Values (TLVs) adopted by the American Conference of Governmental Industrial Hygienists refer to airborne concentrations of substances and are guidance levels which represent conditions under which it is believed that nearly all healthy workers may be repeatedly exposed day after day without adverse effect. The TLV for DEHP is 5 mg/m^3 as an average eight-hour exposure for a five-day work week. In addition, a short-term exposure limit (TLV-STEL) of 10 mg/m^3 has been set for DEHP and is a 15 minute exposure that should not be exceeded at any time during the workday. The Occupational Safety and Health Administration (OSHA) has established a permissible exposure limit (PEL) of 5 mg/m^3 for DEHP under the OSHA General Industry Air Contaminants Standard.

DEHP is listed as a hazardous air pollutant (HAP) in the Clean Air Act Amendments of 1990. As such, its release to the atmosphere will be regulated through the state permit process. The chemical is also listed as an Illinois Toxic Air Contaminant (TAC) under Title 35, Subtitle B, Air Pollution.

A Maximum Contaminant Level (MCL) of 0.006 mg/l of DEHP in drinking water has been established by USEPA under the Safe Drinking Water Act. Aquatic life, human health, and wildlife are protected from adverse impact from certain contaminants in surface water by the narrative toxicity prohibition standard of 35 Illinois Administrative Code 302.210. Site-specific criteria for DEHP have been derived to uphold this standard using the procedures found in Subpart F of the regulations. The Bureau of Water, Division of Water Pollution Control, Planning Section may be contacted for more information on these criteria.

The USEPA requires industry to report discharges or spills of DEHP in an amount equal to or greater than its reportable quantity of 100 pounds. When discarded, DEHP is regulated under the Resource Conservation and Recovery Act (RCRA) and must be managed according to regulations that preclude its release to the environment. In addition, the Federal Food and Drug Administration (FDA) regulates DEHP as an indirect food additive.

CAS/CIS/001

*Note: This information sheet is a summary of readily available data regarding the general nature and effects of this chemical. The reader is encouraged to consult other sources or an appropriate professional if a more detailed explanation for specific concerns is desired.

Printed by Authority of
the State of Illinois
Sep-93 23742 500

Printed on Recycled Paper

UNIVERSITY OF ILLINOIS-URBANA
3 0112 118488755

Gaylord